

WHAT IS CLAIMED IS:

1. A golf clubhead having a heel, a toe, a sole and a top and a striking face between said sole and said top, said clubhead comprising:

a shell having a longitudinally aligned heel section, toe section and medial section, said heel section and toe section defining respective heel and toe surfaces of said sole, said top and said striking face, said medial section having a forward surface spaced rearwardly of said striking face to define an open cavity and having a recess in said forward surface, the material and shape of said heel section and said toe section being selected to provide mass concentration at the heel and at the toe of said clubhead;

a combined elongate body and hosel formed of relatively low mass density material, said body filling said cavity and having an upper portion extending rearwardly of said forward surface and longitudinally located between said heel and toe sections, said body having a top surface as part of said top and a striking surface extending downwardly from said top surface as a part of said striking face, said hosel extending upwardly from said upper surface above said striking surface; and,

an armature disposed within said hosel extending through said upper portion and secured to said body and in said recess.

2. The golf clubhead of claim 1 wherein said combined body and hosel is formed as a single piece.

3. The golf clubhead of claim 1 wherein the combined body and hosel is formed of composite material including graphite fibers and resin.

4. The golf clubhead of claim 1 wherein said combined body and hosel is formed of composite material including glass fibers and resin.

5. The golf clubhead of claim 2 wherein said striking face is a segment of a longitudinal cylindrical surface having a curved cross section.

6. The golf clubhead of claim 2 wherein said medial section defines a medial sole surface rearwardly of said body sole surface.

7. A golf clubhead having a heel, a toe, a sole and a top and a striking face between said sole and said top, said clubhead comprising:

a shell having a longitudinally aligned heel section, toe section and medial section, said heel section and toe section defining respective heel and toe surfaces of said sole, said top and said striking face, said medial section having a forward surface spaced rearwardly of said striking face to define an open cavity and having a recess in said forward surface, the material and shape of said heel section and said toe section being selected to provide mass concentration at the heel and at the toe of said clubhead;

a combined elongate body and hosel formed of relatively low mass density material, said body filling said cavity and having an upper portion and a sole portion extending rearwardly of said forward surface and longitudinally located between said heel and toe sections, said body having a top surface as part of said top, a striking surface extending downwardly from said top surface as a part of said striking face and a sole surface as part of said sole, said hosel extending upwardly from said upper surface above said striking surface; and,

an armature disposed within said hosel and extending through said upper portion and into said lower portion, and secured to said body and in said recess.

8. The golf clubhead of claim 7 wherein said combined body and hosel is formed as a single piece.

9. The golf clubhead of claim 7 wherein the combined body and hosel is formed of composite material including graphite fibers and resin.

10. The golf clubhead of claim 7 wherein said combined body and hosel is formed of composite material including glass fibers and resin.

11. The golf clubhead of claim 8 wherein said striking face is a segment of a longitudinal cylindrical surface having a curved cross section.

12. The golf clubhead of claim 8 wherein said medial section defines a medial sole surface rearwardly of said body sole surface.

13. The golf clubhead of claim 8 wherein said medial section defines an upper surface rearwardly of and below said body top surface.

14. The golf clubhead of claim 8 wherein said medial section defines an upper surface rearwardly of and below said body top surface and a medial sole surface rearwardly of said body sole surface.

15. The golf club of claim 8 incorporated with a golf club shaft having a clubhead end wherein said armature extends above said hosel into said clubhead end.

16. A golf club comprising:

a shaft having a player gripping end and a clubhead end; and

a clubhead having a heel, a toe, a sole and a top and a striking face between said sole and said top and extending from the clubhead end of said shaft, said clubhead including:

a shell having a longitudinally aligned heel section, toe section and medial section, said heel section and toe section defining respective heel and toe surfaces of said sole, said top and said striking face, said medial section having a forward surface spaced rearwardly of said striking face to define an open cavity and having a recess in said forward surface, the material and shape of said heel section and said toe section being selected to provide mass concentration at the heel and at the toe of said clubhead;

a combined elongate body and hosel formed of relatively low mass density material, said body filling said cavity and having an upper portion and a lower portion extending rearwardly of said forward surface and longitudinally located between said heel and toe sections, said body having a top surface as a part of said top, a striking surface extending downwardly from said upper surface as part of said striking face and a sole surface as a part of said sole, said hosel extending upwardly from said upper surface above said striking surface and incorporated with the clubhead end of said shaft; and

an armature disposed within said hosel, secured in said recess and to said body extending through said upper portion and into said lower portion.

17. A golf club according to claim 16 wherein said armature extends above said hosel and into said golf club end of said shaft.

18. A golf club according to claim 17 wherein said combined body and hosel is formed as a single piece.

19. A golf club according to claim 18 wherein said combined body and hosel is formed of composite material including graphite fibers and resin.

20. A golf club according to claim 18 wherein said combined body and hosel is formed of composite material including glass fibers and resin.

21. A golf club according to claim 18 wherein said striking face is a segment of a longitudinal cylindrical surface having a curved cross section.
22. A golf club according to claim 18 wherein said medial section defines a medial sole surface rearwardly of said body sole surface.
23. A golf club according to claim 18 wherein said medial section defines an upper surface rearwardly of and below said body top surface and a medial sole surface rearwardly of said body sole surface.
24. A golf club according to claim 18 wherein said combined body and hosel and said shaft are formed of the same non-metallic material and integrated around said armature.
25. A golf clubhead having a heel, a toe, a sole and a top and a striking face between said sole and said top, said clubhead comprising:
a shell having a longitudinally aligned heel section, toe section and medial section, said heel section and toe section defining respective heel and toe surfaces of said sole, said top and said striking face, said medial section having a forward surface spaced rearwardly of said striking face to define an open cavity and having a recess in said forward surface, the material and shape of said heel section and said toe section being selected to provide mass concentration at the heel and at the toe of said clubhead;
a combined elongate body and hosel formed of relatively low mass density material, said body filling said cavity, having an upper portion extending rearwardly of said forward surface and longitudinally located between said heel and toe sections and having a rear portion extending downwardly from said upper portion and behind said medial section, said body having a top surface as part of said top and a striking surface extending downwardly from said top surface as a part of said striking face, said hosel extending upwardly from said upper surface above said striking surface; and,
an armature disposed within said hosel, extending through said upper portion and secured to said body and in said recess.
26. The golf clubhead of claim 25 wherein said combined body and hosel is formed as a single piece.
27. The golf clubhead of claim 25 wherein the combined body and hosel is formed of composite material including graphite fibers and resin.

28. The golf clubhead of claim 25 wherein said combined body and hosel is formed of composite material including glass fibers and resin.
29. The golf clubhead of claim 26 wherein said striking face is a segment of a longitudinal cylindrical surface having a curved cross section.
30. The golf clubhead of claim 26 wherein said medial section defines a medial sole surface.
31. A method of manufacturing a golf clubhead having a heel, a toe, a sole, a top and a striking face between said sole and said top, the method comprising:
- forming a shell of a relatively high mass density material having a longitudinally aligned heel section, toe section and medial section, said heel section and toe section defining respective heel and toe surfaces of said sole, said top and said striking face, said medial section having a forward surface spaced rearwardly of said striking face to define an open cavity and having a recess in said forward surface, the material and shape of said heel section and said toe section being selected to provide mass concentration at the heel and at the toe of said clubhead;
 - providing an armature;
 - forming a combined body and hosel of a relatively low mass density material, said body having a striking face portion configured to fill said cavity and having an upper portion configured to extend rearwardly of said forward surface and longitudinally between said heel and toe sections, said body having a top surface as part of said top, a striking surface extending downwardly from said top surface as a part of said striking face and a sole surface as part of said sole, said hosel extending upwardly from said top body surface and said armature incorporated within said hosel, extending through said upper portion and secured to said striking face portion to align with said recess;
 - applying a cement to appropriate surfaces of said shell and combined body and hosel that are to be engaged;
 - assembling said body in said cavity with said armature in said recess; and
 - applying pressure between the body and the shell to form a bond therebetween.
32. The method of claim 31 wherein the cement is a two part epoxy resin.
33. The method of claim 31 wherein said recess is configured to provide a gap to accommodate tolerances between said recess and said armature and for cement retention.
34. The method of claim 31 wherein said high mass density material is metallic.

35. The method of claim 31 wherein said low mass density material is a composite carbon and resin material.
36. The method of claim 31 wherein said armature extends upwardly from said hosel to support a club handle.
37. The method of claim 36 including the additional steps of:
providing a hollow shaft of a composite carbon and resin material; and, integrating said shaft with the hosel and surrounding the exposed portion of said armature.
38. A method of manufacturing a golf clubhead having a heel, a toe, a sole, a top and a striking face between said sole and said top, the method comprising:
forming a shell of a relatively high mass density material having a longitudinally aligned heel section, toe section and medial section, said heel section and toe section defining respective heel and toe surfaces of said sole, said top and said striking face, said medial section having a forward surface spaced rearwardly of said striking face to define an open cavity and having a recess in said forward surface, the material and shape of said heel section and said toe section being selected to provide mass concentration at the heel and at the toe of said clubhead;
providing an armature;
forming a combined body and hosel of a relatively low mass density material, said body having a striking face portion configured to fill said cavity and having an upper portion and a sole portion configured to extend rearwardly of said forward surface and longitudinally between said heel and toe sections, said body having a top surface as part of said top, a striking surface extending downwardly from said top surface as a part of said striking face and a sole surface as part of said sole, said hosel extending upwardly from said top body surface and said armature incorporated within said hosel, extending through said upper portion and into said sole portion and secured to said striking face portion to align with said recess;
applying a cement to appropriate surfaces of said shell and combined body and hosel that are to be engaged;
assembling said body in said cavity with said armature in said recess; and
applying pressure between the body and the shell to form a bond therebetween.
39. A method of manufacturing a golf clubhead having a heel, a toe, a sole, a top and a striking face between said sole and said top, the method comprising:

forming a shell of a relatively high mass density material having a longitudinally aligned heel section, toe section and medial section, said heel section and toe section defining respective heel and toe surfaces of said sole, said top and said striking face, said medial section having an upright wed defining a forward surface spaced rearwardly of said striking face to define an open cavity and having a recess in said forward surface, the material and shape of said heel section and said toe section being selected to provide mass concentration at the heel and at the toe of said clubhead;

providing an armature;

forming a combined body and hosel of a relatively low mass density material, said body having a striking face portion configured to fill said cavity and having an upper portion configured to extend rearwardly of said forward surface and extending longitudinally between said heel and toe sections and a rearward portion extending downwardly from said upper portion behind said wall, said body having a top surface as part of said top, a striking surface extending downwardly from said top surface as a part of said striking face and a sole surface as part of said sole, said hosel extending upwardly from said top body surface and said armature incorporated within said hosel, extending through said upper portion and secured to said striking face portion to align with said recess;

applying a cement to appropriate surfaces of said shell and combined body and hosel that are to be engaged;

assembling said body in said cavity with said armature in said recess; and

applying pressure between the body and the shell to form a bond therebetween.

forming a combined body and hosel of a non-metallic material with an armature extending through said hosel and into said body, said body configured to fill said cavity and having an upper portion configured to extend rearwardly of said forward surface and longitudinally between said heel and toe sections, said body having a top surface as part of said top, a striking surface extending downwardly from said top surface as a part of said striking face and a sole surface as part of said sole, said hosel extending upwardly from said top body surface, said armature extending within said hosel, through said upper portion and secured to said body;

applying a cement to surfaces of said shell and combined body and hosel that are to be engaged;

assembling said body in said cavity and said armature in said recess; and

applying pressure to the parts to form a bond therebetween.